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Matthew Jarron

"Drawn from structures living and dead" –

Art Collections and Connections, Growing and Forming

In January 1901, the 21-year-old artist George Dutch Davidson wrote to his mentor, John Duncan: 'Professor D'Arcy Thomson [*sic*] came up and introduced himself to me, and asked me to decorate a space above his fire-place in the College. There will be three fair-sized panels: an Orpheus, a Neptune and a Juno.'¹

As it turned out, this would be the last letter Davidson wrote before his untimely death, and the commission was never completed, but it provides clear evidence of D'Arcy Thompson's engagement with contemporary artists, and his part in a fascinating nexus of art and science that had developed in Dundee at the turn of the century. A key starting point for this was D'Arcy's close friend and colleague at University College, Dundee (UCD), Patrick Geddes (1854-1932).

Geddes came to Dundee in 1888 to take up a Chair of Botany at UCD that had been specially created for him and endowed by an important patron of the arts and sciences in Dundee, James Martin White. Born in 1857, White had started his career in the family textile business, J F White & Co, before inheriting the estate of Balruddery on the death of his father in 1884. A Fellow of the Royal Physical Society, White's scientific endeavours included lighting his house with electricity.² He became actively involved in educational causes, and was a keen supporter of UCD, which had been founded in 1881. White's wife, Mary Macrae, was a painter and the couple were also art collectors, owning works by G.F. Watts and Gaston la Touche

among others, as well as a notable collection of oriental art.³ He would later become Honorary President of Dundee Art Society, his wife already being a professional member.

White was also an active member of the Dundee Naturalists' Society and would have known Geddes from his lectures to the Society (the first of which was in January 1881) if not earlier – one of Geddes's biographers describes them as boyhood friends.⁴ Certainly as a youth Geddes attended science classes at the YMCA in Dundee and may have met White then. In 1884 Geddes had applied for the Chair of Biology at UCD but lost out to D'Arcy Thompson, though this did not prevent them from being good friends later on.⁵ White was evidently determined to bring Geddes to Dundee, and this part-time chair seemed the ideal way – Geddes was only required to be present for the summer term, leaving him free to pursue his many other interests during the rest of the year.

Although Geddes had trained as a biologist, he was already developing much wider political and sociological ideas by the time he took up the Dundee chair – his published papers by that time included 'An Analysis of the Principles of Economics', 'Conditions of the Progress of the Capitalist and of the Labourer' and 'Co-operation vs Socialism'.⁶ He had also developed unusual abilities as a visual thinker, using sheets of folded paper to classify ideas into tables that he called 'thinking machines' – a legacy from a period of temporary blindness that he suffered while in Mexico in 1879-80.

It is not surprising, therefore, that Geddes took a swift interest in Dundee's increasingly vibrant art culture – in 1890 the city was described by one leading

Scottish painter as 'perhaps the most vital centre of art appreciation in Scotland.'⁷ A museum and art gallery opened in the Albert Institute in 1873, and became home to major blockbuster art exhibitions that were the biggest of their kind outside London, attracting artists across the country. At the same time, Dundee was home to one of the country's largest newspaper industries, and in 1880 the *Dundee Advertiser* became the first daily paper in Britain to employ a regular staff artist. Art education was also expanding at that time thanks to the Dundee Technical Institute founded in 1888, out of which would grow Dundee College of Art (now Duncan of Jordanstone College of Art & Design).⁸

Dundee's artists were also coming together to promote their work, in particular through the Graphic Arts Association (GAA) founded in 1890. Geddes took a quick interest in this society, becoming an Associate Member in 1891. In May that year he approached the society with a request to create a series of oil and watercolour paintings of plant life that he could show to his students. One of the members who approved the scheme was the painter John Duncan (1866-1945), so if he had not already met Geddes, he must surely have done so at the GAA meeting of 1 June 1891 which Geddes hosted at UCD.

Under Geddes's influence, Duncan would go on to become the leading artist of the Celtic Revival in Scotland. Geddes had become convinced that the study of biological systems could help in understanding the evolution and complexities of city life. When not teaching at UCD, he was spending much of his time on social and urban renewal projects in Edinburgh's Old Town. Geddes believed in the principle that 'cities flourished or declined according to the people who lived in them' and as a first step towards practical regeneration of the area he left his comfortable New

Town flat and moved into a dilapidated tenement in the Old Town in 1886, which he and his wife proceeded to renovate.⁹ In 1887 he started hosting annual Summer Meetings, which brought together leading intellectuals from various countries 'interested in the reconciliation of specialisms with synthesis of knowledge'.¹⁰ The programmes featured lectures, seminars and excursions, and embraced both science and the arts. Duncan is known to have attended from 1891 and would soon be asked by Geddes to take charge of the art content of the meetings.

Initially, Geddes channelled many of his ideas for renewal through the Edinburgh Social Union, which championed the idea of bringing art and decoration into the lives of working people. A key starting point for this was the Arts & Crafts movement and the ideas of William Morris, but Geddes believed that Morris had failed in his intentions to give art to the people, recognising that his products were too expensive for the average working man to afford.¹¹ By 1892, Geddes had distanced himself from the Arts & Crafts movement, believing it to be 'essentially dominated by capitalistic consumption' and had also left the Edinburgh Social Union.¹² He would now pursue his own cultural agenda, the 'Celtic Renaissance', with John Duncan as his principal ally.

Geddes had observed the social and cultural developments that had taken place in Ireland and Wales.¹³ Although there had been some development in Scotland (particularly the popularity of the Kailyard school of literature), it had largely continued the trend begun during the Enlightenment and then made fashionable by Walter Scott of re-imagining Scotland as 'North Britain'. Geddes, who was generally opposed to Enlightenment thinking as symptomatic of the New Town rather than the Old, preferred to stress Scotland's pre-Union Celtic culture, which linked it

internationally to Ireland and Continental Europe. He hoped that through remembering and celebrating the past, people's outlook for the future could be strengthened – 'in some young soul here and there the spirit of the hero and the poet may awaken' – and it was this that he referred to as 'our Scottish, our Celtic Renaissance'.¹⁴

Geddes found an ideal collaborator in Duncan. Born and educated in Dundee, he had quickly developed an interest in scenes from mythology and fairy tales, and during further study on the Continent he became fascinated by the symbolist art that was then much in fashion. Geddes encouraged Duncan to draw on traditional Celtic stories and songs, linking them visually with the unique and distinctive style of decoration that Duncan would already have known from the many Pictish stones in the countryside north of Dundee. In 1892, Duncan moved to Edinburgh, where he was soon hard at work creating an elaborate series of murals for the halls of residence which Geddes founded, as well as other Old Town buildings. He also acted as art editor for the centrepiece of Geddes's Celtic Revival movement, the seasonal publication *The Evergreen*. Distinctively Scottish, it was also truly international, featuring Irish, English, American, French and Dutch contributors, and from a wide range of disciplines including biology and the social sciences. Geddes also appointed Duncan as director of his Old Edinburgh School of Art, founded to teach Celtic design and ornament.

By 1897, most of Geddes's Edinburgh projects had come to an end due to lack of money, and Duncan returned to Dundee where he encouraged his fellow artists and designers to embrace the Celtic Revival in their work. Many of Dundee's leading artists, including Stewart Carmichael, Alec Grieve and George Dutch

Davidson, had also studied on the Continent and shared Duncan's love of symbolism. A distinctive style of Celtic-infused symbolist art developed in Dundee which was shown off (usually to a fairly hostile critical reception) at GAA exhibitions.

Davidson in particular worked closely with Duncan, sharing his studio in Albert Square and enthusiastically embracing Celtic design. Fellow Dundee artist David Foggie recalled: 'Under John Duncan's teaching he became enthusiastic in the study of Celtic art, a style fascinating to him from its essential decorative character and its weird beauty; he liked to feel a personal relationship with it, and often associated his own imaginative gifts with the thought that his ancestors in some far back time were Highlandmen.'¹⁵

Born in 1879, Davidson had originally intended to follow his father in becoming an engineer, but a severe bout of flu in 1896 left him with a serious heart condition which prohibited him from working. He turned to watercolour painting and created some astonishingly original pieces including an intense psychological self-portrait and some purely abstract paintings that now seem way ahead of their time (all now in The McManus: Dundee's Art Gallery & Museum).

The commission from D'Arcy Thompson would have been the most ambitious undertaking of Davidson's career – three decorative panels for his study at UCD featuring figures from Classical mythology surrounded by representative animals. Davidson's sudden death at the age of just twenty-one meant these were never completed, and all that survives today is a pencil study for the Orpheus panel (now in The McManus: Dundee's Art Gallery & Museum) [image 1]. In its use of the four elements, the twelve animals of the zodiac and possible references to the Golden

Ratio, it shows that Davidson clearly understood D'Arcy's interests in natural history, mathematics and Classics, and is the first example of an artist drawing inspiration from his work – though many more would follow.

D'Arcy never sought a replacement for this project, but he clearly had an interest in supporting local artists. On taking up his post at UCD in 1885, he employed the designer and illustrator James Eadie Reid to create drawings and diagrams for him.¹⁶ This seems to have been a full-time post since Reid gave up his job as a newspaper artist with the *Dundee Advertiser* in order to take it, but it evidently did not last long as D'Arcy would later use various other illustrators for his publications, mostly amateurs. Madge Valentine, for example, drew diagrams for his *Glossary of Greek Birds* (figure 238).¹⁷ D'Arcy also commissioned teaching models from local sculptors J. Gonnella & Co as well as companies further afield such as Fric of Prague.

Thompson soon got to know the art community in Dundee. In 1886 he chaired the annual prize-giving festival of Dundee School of Art, which must have been a somewhat awkward affair since the prizes themselves hadn't arrived yet!¹⁸ In his speech, however, Thompson extolled the virtues of an interdisciplinary education in art and science. In 1917 he gave the introductory speech at the opening of a Dundee Art Society exhibition, referring to 'my artist friends' but saying that 'I have neither technical nor historic knowledge of art to impart to you, and nothing in the world but my share of that love of art and of natural beauty which brings us all here together.'¹⁹

In one area, however, Thompson did have a detailed knowledge of art, one which combined his knowledge of zoology and Classics. In 1898 he presented a

paper to the Royal Society of Edinburgh on 'The Emblems of the Crab in Relation to the sign Cancer', one of a number of talks given about the symbolic representation of animals in classical and ancient art. Two years earlier Geddes had written to him saying 'I am glad to see that you are holding forth on Symbolism, and write to remind you of my suggestion that you should contribute a short paper to the Summer [issue of the] Evergreen on this subject.'²⁰ Sadly Thompson never took Geddes up on this invitation.

In 1910, Thompson became the prime mover to have the British Association for the Advancement of Science return to the city for the first time since 1867, convincing the Lord Provost to hold a public meeting to discuss the matter.²¹ Two years later his efforts were rewarded, and Thompson not only acted as the local organising secretary for the meeting and vice president of the zoology section, but also served on the Fine Art Committee that organized the accompanying exhibition at the Victoria Galleries. Four engravings from his own collection were included in the show – a reproduction of Raphael's *Madonna and Child and the Infant St John* by Francesco Bartolozzi (1727-1815); *A River in France* by Gaston Coindre (1844-1914) and two etchings (*London River* and *Dundee from Tayport*) by Frank Laing (1862-1907), a local artist with an international reputation.²² Exactly what else Thompson's collection consisted of is unclear, but his very traditional tastes can clearly be seen from surviving photographs of Gowrie Cottage [image 2], a small house in Barnhill, just outside Dundee, where Thompson moved after his marriage in 1901. Although the walls are lined with pictures, a closer inspection suggests that almost all of them are reproductions. Perhaps he only started to acquire originals later in life, or perhaps such purchases were just rare exceptions.

We know that in 1933, by which time he had moved to St Andrews, Thompson wrote to Stanley Cursiter, director of the National Gallery of Scotland, to help identify a painting he had acquired – Cursiter replied suggesting it was a Flemish work of the 1680s.²³ An invoice from the art dealers Doig, Wilson & Wheatley in 1935 refers to a picture acquired from the Society for Scottish Artists exhibition as well as the varnishing of a ‘small Sienese painting’, again suggesting an interest in the Old Masters.²⁴

Regarding contemporary artists, we know that in 1913 Thompson employed one of Dundee’s leading figurists, David Foggie, to do a portrait of his children,²⁵ and in 1936 would sit for a portrait himself by Foggie, which ‘captures something of the overflowing kindness of that genial personality’.²⁶ As his reputation grew in the 1930s and 40s he was often asked to be the subject of portraits, including sculptural pieces by Gilbert Coleridge (1859-1953) and Alfred Forrest (1909-95) and a drawing by Hubert Freeth (1913-86). Most notable, however, were the portraits by Glasgow painter David S Ewart (1901-65), for whom Thompson sat (or rather stood) in 1938. Ewart would ultimately produce three versions of the painting, one for the Royal Society of Edinburgh (of which Thompson was elected President in 1934), one for the University of St Andrews and one for UCD [image 3]. ‘I had a magnificent subject,’ Ewart wrote, ‘and no artist would have felt anything but inspired.’²⁷

What is also clear is that throughout his life, Thompson befriended and corresponded with artists. We can date this back to an exceptional childhood, when several of Scotland’s leading artists were close friends of his family. These included the landscape painter Sam Bough (1822-78), the portrait and genre painter Robert Herdman (1829-88), the painter and photographic pioneer David Octavius Hill (1802-

70), the historical and mythological painter Joseph Noel Paton (1821-1901, whose son Diarmid was at school with Thompson and would later become a notable physiologist) and the painter and sculptor George Clark Stanton (1832-94), who was married to Thompson's aunt [image 4]. Later correspondence from the engraver Henry Macbeth-Raeburn (1860-1947) suggests that he too was a childhood friend.²⁸

In later years, as well as his Dundee friends, he knew the English realist painter Dame Laura Knight (1877-1970) well – in 1931 she wrote to thank him for a walk he had taken her on featuring lots of ducks!²⁹ He also corresponded with, among others, the English painter William Rothenstein, the Irish-based painter Elizabeth Rivers and the Scottish painters John Bowie and Keith Henderson. Other notable figures from the art world that he was in contact with included Daniel V Thompson of the Courtauld Institute; Paul Lambotte of the Musée des Beaux-Arts in Paris; and Beaumont Newhall of the Museum of Modern Art in New York.³⁰

There is no doubt that Thompson's love of art and his affinity with artists contributed to the interdisciplinary nature of his work. As a new and small institution, UCD was peculiarly suited to encouraging crossovers between the disciplines. Many of Thompson's colleagues shared his artistic interests – the anatomy professor A.M. Paterson, for example, taught a course on Artistic Anatomy and was strongly outspoken on the current state of art education and appreciation.³¹ The mathematics professor J.E.A. Steggall was a keen amateur photographer and served on the council of Dundee Art Society. Most passionate, however, in uniting art and science was Patrick Geddes, whose teaching 'was somewhat of a shock to the student who came expecting to get notes which he could learn by heart and recite at his forthcoming examination.' According to one former student, a typical lecture 'might

quite as likely have been Ancient History or Fine Art or Political Economy, as a note about the structure or habits of one of the prescribed plants.’³²

While Thompson also loved to bring art and the Classics into his teaching, it is clear that he and Geddes disagreed on how far this could be taken. ‘I thoroughly recognise the contrast you urged between the two methods of Biological teaching of Art and Science respectively,’ Geddes reassured Thompson in 1894, but continued: ‘In Dundee I have been obliged (I thought by force of circumstances) to specialise too much on the scientific side’.³³ Two years later Thompson complained: ‘the time has gone by for the popular or artistic work which you have hitherto encouraged’ but Geddes insisted that ‘here I must continue my ways. Popular and artistic teaching are specially and peculiarly for a chair of botany, beyond all other chairs of science... Furthermore in our town and college there is no point at which any of us can be more obviously, practically, & industrially useful, than at this one of mine – the botanist as designer.’³⁴

Geddes later wrote a series of articles in the *Dundee Advertiser* titled ‘Recent Art Movements in Dundee’, the last of which included a plea for scientists to learn from artists:

where can we look for real light, for practical leading, than to the arts? But to these not merely... in their humbler and more mechanical forms, but their supreme ones, the arts of co-ordination and of expression, the arts of skill, the art of seeing. And who ... has ever expressed an ideal in most manifest and enduring yet subtlest form, in fullest mastery of matter, like the sculptor?

Who has ever seen things real, and shown them as they truly are, like the painter, and who else can so worthily display them as they may be? ... [As] Science herself rises from her analyses of nature considered as dead, to comprehend everything from actual evolution in nature and man and, in his cities, all discerned as living, she will be first to claim for art a renewed and higher place.³⁵

Although Geddes is not directly referenced in *On Growth and Form*, his influence pervades it. Throughout the book, Thompson writes in aesthetic terms about the organisms and mathematical patterns he describes, and frequently uses artistic analogies, comparing organic forms to the work of the potter or the glassblower. In contrast to most of the scientific textbooks that preceded it, *On Growth and Form* is richly illustrated – indeed its illustrations have arguably become more influential than its text. It is important to note here that despite his love of art, Thompson himself was no artist, and relied on others to create illustrations for him – for *On Growth and Form* these were principally the work of his assistant at UCD, Doris Mackinnon (1883-1956), and one of his former students, Helen Ogilvie (1880-1960).

It is no surprise that many of the others whose work helped to shape *On Growth and Form* also brought together art and nature. These included Ernst Haeckel (1834-1919), the German biologist whose extraordinary illustrations of radiolaria in *Art Forms in Nature* (1899-1904) Thompson drew on liberally; indeed, he owned a set of plaster models of radiolaria based on Haeckel's artworks.³⁶ Another important precursor was the art critic Theodore Cook (1867-1928), whose

books *Spirals in Nature and Art* (1903) and *The Curves of Life* (1914) contained an admirably wide range of examples, although Thompson dismissed the ‘mystical conceptions’ of those like Cook who saw in the logarithmic spiral ‘a manifestation of life itself’,³⁷ and bluntly dismissed the notion that the sequence of numbers dictating it converged on the Golden Mean as ‘a mathematical coincidence devoid of biological significance’.³⁸

Also relevant here is Thompson’s friendship with the Danish artist and palaeontologist Gerhard Heilmann (1859-1946). Having abandoned his medical studies to become a professional artist, Heilmann’s series of papers on the origin of birds (1913-16) were dismissed by the biological establishment in Denmark but found an enthusiastic welcome from Thompson, who described them as ‘beautiful and original’³⁹ and began a correspondence which led to Heilmann contributing several of the celebrated transformation diagrams in *On Growth and Form*.

These iconic diagrams also relied on Thompson’s knowledge of art, taking as his starting point Albrecht Dürer’s work on geometry and proportion. In his *Four Books on Human Proportion* (1512-28), according to Thompson, ‘the manner in which the human figure, features, and facial expression are all transformed and modified by slight variations in the relative magnitude of the parts is admirably and copiously illustrated.’⁴⁰ As well as dealing with transformations of the human form, Dürer’s work on proportion also encompassed his theories of ideal beauty, claiming that, while beauty was ordered by as-yet undefined laws, it was not an objective concept but was based on the infinite variety of nature – this would surely have struck a chord with Thompson, whose work aimed to reveal the fundamental laws that governed the extraordinary variety of nature’s patterns.

Reviews for *On Growth and Form* appeared in publications as diverse as *Country Life*, the *Times Literary Supplement*, *Veterinary Review* and *Engineering*. Cambridge University Press could afford to send out only a small number of review copies, and in November 1917 they wrote to Thompson to say that the *Journal of Decorative Art* had asked for a copy. Thompson replied to say: 'It does not seem to me that it is a publication which is of much interest or importance to us', clearly suggesting that he had no idea of the kind of artistic significance his work would have.⁴¹ It was only towards the end of his life that Thompson began a correspondence with the art critic Herbert Read (1893-1968), who arguably did more than anyone to raise awareness of *On Growth and Form* among painters, sculptors and designers. In 1942, Read told Thompson 'I wonder if I ever thanked you for the enlightenment I got from your book "On Growth and Form": it helped me where perhaps you never intended it to help – in the understanding of art.'⁴²

As for Thompson's opinions of the modern abstract painters and sculptors of the 1930s and 40s who were so inspired by his work, it's unlikely that he would have been a great enthusiast, though it does at least seem like he tried. In 1946 he wrote to Read praising his book *A Coat of Many Colours* and saying: 'I envy you your knowledge of, and your sympathy for, a number of modern men whom I have had all too little patience to study and understand ... Ben Nicholson [is] within my ken. But I have got along without Picasso, easily enough'.⁴³

Image 1:

George Dutch Davidson, *Orpheus*, pencil study for decorative panel, 1900, reproduced in *George Dutch Davidson 1879-1901 – A Memorial Volume* (1902), Dundee: Graphic Arts Association.

Image 2:

Interior of D'Arcy Thompson's home at Gowrie Cottage, c.1901.

Courtesy of University of St Andrews Library Special Collections.

Image 3:

David S. Ewart, *Professor Sir D'Arcy Wentworth Thompson*, 1938/50.

Courtesy of University of Dundee Museum Services.

Image 4:

George Clark Stanton, Portrait of D'Arcy Wentworth Thompson aged five, 1865.

Courtesy of University of St Andrews Museum Collections.

Author's biography:

Matthew Jarron is Curator of the University of Dundee Museum Collections, which comprise art, science and medical history as well as the D'Arcy Thompson Zoology Museum. He is the author or co-author of several books including *The Artist & the*

Thinker: John Duncan & Patrick Geddes in Dundee (2004), *D'Arcy Thompson and his Zoology Museum in Dundee* (2010), *Independent & Individualist - Art in Dundee 1867-1924* (2015) and *Growing and Forming: Essays on D'Arcy Thompson* (2017). He has also guest-edited issues of the *Journal of the Scottish Society for Art History* and *Interdisciplinary Science Reviews*.

¹ Quoted in an appreciation in the *Dundee Advertiser* 10 January 1901 – the same letter is reproduced in *George Dutch Davidson: A Memorial Volume* (Dundee: Graphic Arts Association, 1902) but with Thompson's name excised.

² *The Piper o' Dundee* 28 March 1888.

³ White regularly lent paintings to the Graphic Arts Association exhibitions, and his oriental collection was exhibited at the Victoria Galleries in 1899-1900.

⁴ Boardman, P. (1978). *The Worlds of Patrick Geddes*, London, Henley & Boston: Routledge & Kegan Paul Ltd, 78.

⁵ Some of the various and complicated causes of this are discussed in Macdonald, M. (2004), 'Patrick Geddes – Science and Art in Dundee', in M. Jarron (ed.), *The Artist & the Thinker – John Duncan & Patrick Geddes in Dundee*, 13-29, Dundee: University of Dundee Museum Services.

⁶ For full bibliographic details, see Meller, H. (1990) *Patrick Geddes: Social Evolutionist and City Planner*, London & New York: Routledge.

⁷ W.D. McKay, quoted in the Dundee Graphic Arts Association Annual Report 1890 (Dundee Central Library, Local History Centre).

⁸ For more on this period see Jarron, M. (2015) *Independent & Individualist: Art in Dundee 1867-1924*, Dundee: Abertay Historical Society.

⁹ Meller, op. cit., 70.

¹⁰ Boardman, op. cit., 129.

¹¹ Geddes, P. (c.1893-4) 'The Work of the Art School' annotated manuscript (University of Strathclyde Archives, T-GED 5/1/18).

¹² Ibid.

¹³ See Meller, op. cit., 63-4.

¹⁴ Geddes, P. (1895) 'The Scots Renaissance', *The Evergreen*, Spring 1895, 139.

¹⁵ Ibid., 4.

¹⁶ *The Piper o' Dundee* 7 August 1889.

¹⁷ Madge was a close friend of Thompson's star student, Mary Lily Walker, and was married to W R Valentine, a life governor of UCD.

¹⁸ *Dundee Courier* 29 December 1886.

¹⁹ Typed MS of address by D'Arcy Thompson (University of St Andrews Library Special Collections MS 45704). In 1924 Thompson was made an Honorary Member of Dundee Art Society.

²⁰ Letter to D'Arcy Thompson 25 January 1896 (University of St Andrews Library Special Collections, MS 16359).

²¹ *British Association, Dundee 1912: Handbook and Guide to Dundee and District* (1912), Dundee: David Winter & Son.

²² *Illustrated Catalogue of a Loan Collection of Paintings, Watercolours & Engravings in the Victoria Art Galleries, Dundee on the occasion of the British Association Meeting* (1912), Glasgow: University Press.

²³ Letter from Stanley Cursiter to D'Arcy Thompson 11 July 1933 (University of St Andrews Library Special Collections MS 13031/1).

²⁴ Invoice from Doig, Wilson & Wheatley January 1935 (University of St Andrews Library Special Collections MS 46483).

²⁵ The commission is noted in Foggie's accounts book (held by the artist's family). The portraits are untraced.

²⁶ From a review of the Dundee Art Society exhibition dated 20/3/1936, in volume four of Stewart Carmichael's scrapbooks (Dundee City Archives). The portrait is untraced.

²⁷ Letter from D S Ewart to A D Peacock 22 November 1948 (University of St Andrews Library Special Collections MS 48539).

²⁸ Letter from Henry Macbeth-Raeburn nd (c.1841) (University of St Andrews Library Special Collections MS 18222).

²⁹ Letter from Laura Knight 28 July 1931 (University of St Andrews Library Special Collections MS 25404).

³⁰ All letters in the University of St Andrews Library Special Collections – see index at <https://www.st-andrews.ac.uk/media/special-collections/documents/Darcy%20Wentworth%20Thompson%20Index.pdf>.

³¹ 'Artistic Anatomy' (1890), *The College* February 1890.

³² Obituary of Patrick Geddes in *The College* June 1932.

³³ Letter from Patrick Geddes 28 May 1894 (University of St Andrews Library Special Collections, MS 16362).

³⁴ Letter from Patrick Geddes 7 April 1896 (University of St Andrews Library Special Collections, MS 16363).

³⁵ Geddes, P. (1907) 'Art in Civic Progress and in Education', *Dundee Advertiser* 11 February 1907.

³⁶ Four of these models are still held in the D'Arcy Thompson Zoology Museum, University of Dundee

³⁷ Thompson, D.W. (1942) *On Growth and Form*, second edition, Cambridge: University Press, 751.

³⁸ Thompson, D.W. (1917) *On Growth and Form*, Cambridge: University Press, 649.

³⁹ Thompson, 1942, op. cit., 1080.

⁴⁰ Thompson, 1917, op. cit., 740-1.

⁴¹ Letter from D'Arcy Thompson to Cambridge University Press 15 November 1917 (University of St Andrews Library Special Collections MS 42633).

⁴² Letter from Herbert Read nd (1942) (University of St Andrews Library Special Collections, MS 19370).

⁴³ Letter to Herbert Read 28 July 1946 (University of St Andrews Library Special Collections, MS 45690).